**From:** Robert Siegfried [mailto:rsiegfried@valleywater.org]
**Sent:** Monday, November 28, 2011 4:12 PM
**To:** Agriculture Water Use Efficiency
**Cc:** Jemaa, Fethi Ben
**Subject:** chloride balance

AgWUE:

It is instructive to see confirmation in Blake Sanden's note of 10/31/11 to AgWUE of substantial deviations of ETc's from the ideal ETc's estimated by the two-step Kc*ETo method.

The applicability of the formulas contained in that note for calculating the leaching requirement, reclamation, and permissible concentration factors (Methods 1, 2 and 3, respectively) may be questioned. Further explanation of how leaching requirement calculations derived from water quality parameters (seemingly meant to be guides to estimating amounts of irrigation required beyond ETc's rather than to be estimates of the efficacy of the applied leaching fraction) are relevant to field specific conditions would be helpful. Presently, their applicability appears to be in estimating a baseline leaching requirement from irrigation water quality. Sampling problems arise when drainage water EC or chloride concentration is required. The sampling issue is not addressed in these three methods.

The site specific example of Method 4 involving two irrigation systems and based on twenty sites per system spanning 51 acres would have been more informative had standard deviations and coefficients of variation been supplied. The appended paper Zohrab Samani et al., "Measuring On-farm Irrigation Efficiency with Chloride Tracing under Deficit Irrigation" J. Irrigation and Drainage Engineering 131:555-559, also lacks information on the variability of the authors' chloride samples. These are not fatal flaws, but a cautionary note is required. We do not know the eventual uses to which the report on the quantification of agricultural water use efficiency will be put. I refer AgWUE to Biggar, J.W. and D.R. Nielsen (1976) "Spatial Variability of the Leaching Characteristics of a Field Soil", Water Resources Research 12:78-84, for estimates of sample sizes required for several confidence levels. If the methods of Blake's note are incorporated in the report, a comment on the significant uncertainties of these methods should be included.

Regards,

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